

Can active video gaming improve executive functions in children with ADHD?

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In childhood, Attention Deficit Hyperactivity Disorder (ADHD) is one of the most frequent mental disorders. Inattentiveness, impulsivity and hyperactivity are its key symptoms, which are associated with deficits in Executive Functions. Although medication usually has an effect on symptoms and cognition, possible side effects and missing commitment call for alternative treatments. Cognitive trainings are frequently used for this purpose, although transfer effects to untrained areas seem to be limited. Interventions combining physical and cognitive demands targeting a broader range of cognitive processes might be a means to increase potential effects on Executive Functions. Therefore, in the current study the effects of a cognitively and physically demanding active video gaming intervention on Executive Functions of children with ADHD was examined. Children diagnosed with ADHD between 8-12 years were randomly assigned to either an eight-week active video gaming intervention group ($n = 19$), which included three training sessions per week à 30 minutes, or a waiting-list-control group ($n = 17$). Before and after the interventional period, their performance in updating (color span backwards), inhibition and shifting (Simon task; Flanker task) was assessed. Manipulation checks indicate that children in the active video gaming intervention trained on average 2.5 times a week and training was physically and cognitively challenging to them. ANCOVAs (one-tailed; pre-test values as covariates) revealed that children in the intervention group improved their inhibition and shifting performance significantly, compared to control condition ($ps < .05$). In the current study, a combination of cognitive and physical training in children with ADHD could reveal positive effects with regard to inhibition and shifting. Therefore, in future, active video gaming might serve as adjunct to regular treatment in order to improve Executive Functions in children with ADHD. However, tailored exergames including improvements in cognitive as well as physical challenge are warranted.